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ABSTRACT

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VOCATIONAL CHOICE CHANGE PATTERNS OF A NATIONAL SAMPLE OF COMMUNITY-JUNIOR COLLEGE STUDENTS

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The two primary purposes of this study were (a) to examine the frequency and direction of changes in vocational choices among community-junior college students, and (b) to determine the multivariate utility of a number of independent variables for distinguishing between those who did and those who did not make a change in their vocational choice. Holland's psychological classification scheme for vocations (1966) was employed both for grouping vocational choices into six major categories and for classifying individual vocational choice changes into five mutually exclusive groups.

According to Holland's occupational classification scheme (Holland, Viernstein, Kuo, Karweit, & Blum, 1970) vocational choices are (a) initially made in a fashion that is related to an individual's personality type, and (b) changed most frequently to similar vocational choices. Holland and his associates have developed a geometric hexagonal model in which the six categories are ordered around the points of the figure. Could the distance between any two occupations which comprise a change in vocational choice, in the hexagonal model, be inversely related to the frequency with which that change is made? When a person changes vocational choice is that person more likely to change to a closely related vocation than to a remotely related vocation? Do persons who change their vocational choices differ in meaningful or systematic ways from those who keep their original vocational choice?

A number of studies of change in vocational choice have viewed change in terms of Holland's theoretical framework (Elton & Rose, 1970; Folsom, 1969; Holland et al., 1970; Holland & Lutz, 1967, 1968; Holland & Nichols, 1964; Holland & Whitney, 1968; Holland, Whitney, Cole, & Richards, 1968; Osipow, Ashby, & Wall, 1966). However, because of several important limitations, their findings have been restricted in terms of generalizability to the population at large. The two primary reasons for these limitations are that (a) each of the previously cited studies has used primarily 4-year college and university students in its samples, and (b) with the exception of two of the nine studies (Folsom, 1969; Osipow et al., 1966), neither of which were longitudinal studies, none encompassed more than a 12-month period of time. Clearly, Holland's theory needs to be studied longitudinally "for longer intervals of time . . . to learn if the findings hold for longer periods [Holland & Whitney, 1968, p. 18]."

With regard to the first of these points of criticism, it is important to note that students attending junior colleges "are more representative of the population as a whole, rather than being skewed toward the middle and upper socioeconomic levels as is the case of student enrollees of four-year colleges and universities [Garbin & Vaughn, 1971, p. 178]." The fact that students in 2-year college environments seem to be more representative of the general population makes these groups of students much better suited for model testing than are groups of students from 4-year college and university environments.

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[1] This research report was begun while the senior author was a Research Assistant at The American College Testing Program. Dr. Scott is now Assistant Research Professor in The Teaching Research Division of the Oregon State System of Higher Education. Dr. Fenske is now Professor of Higher Education and Director of the Center for the Study of Higher Education at Arizona State University, Tempe. Dr. Maxey is Director of Research Services at ACT.

Methodology

The instruments. The Career Planning Profile (CPP) was the primary instrument used in this study. Designed by The American College Testing Program's (ACT) Research and Development Division, the Career Planning Profile provides individual students with considerable information about their career plans, and at the same time, it also provides institutions with more information about their incoming students than had previously been available to them. The instrument collects background information and assesses interests, abilities, career preferences, and goals (The American College Testing Program, 1972).

The second instrument used in this study was the Spring 1972, Career Planning Profile Follow-up Questionnaire (SCPP). The primary function of this instrument was to collect the postmeasures of expressed vocational choice.

Administration of the instruments. The Career Planning Profile was administered at the 62 colleges as part of a national norming in fall 1970, which is described in detail in the *Handbook for the ACT Career Planning Program* (The American College Testing Program, 1972). All of the follow-up questionnaires were administered directly or indirectly by personnel from each of the 62 participating institutions. Materials were sent from ACT via bulk mailings on March 1, 1972. Two types of administration procedures were suggested to the institutions: (a) on-site administration of the SCPP to all currently enrolled students, and (b) a mail survey of all current and previously enrolled students. A combination of the above two methods was most common. Data collection ceased on May 5, 1972. A total of 4,592 completed questionnaires were returned from the 62 participating institutions. It was not possible to compute an overall response rate since not all of the colleges reported the number of questionnaires administered. A wide variance in response rate among the colleges was indicated among the colleges who reported. The variance was mainly related to the type of questionnaire administration, with on-site administration producing a much higher response rate than mailed questionnaires.

The independent variables. Variables included in the study were family income, father's level of education, mother's level of education, high school grade-point average, seven ability measures (mechanical skills, nonverbal reasoning, clerical skills, numerical computation, mathematical reasoning, space relations, and reading skills), four nonacademic competencies (arts, business contact, business detail, and science), eight interest scales (scientific, health, artistic, social service, business contact, business detail, trades, and technology), and sex. Sex was used both as an independent and as a control variable.

The dependent variable. The dependent variable was constructed by applying Holland's classification scheme to each student's fall 1970, expressed vocational choice (first choice), and then to his or her spring 1972, expressed vocational choice (first choice).

The groupings or categories were defined by examining the arrangements of the occupations within the hexagon (see Figure 1) and the various types of vocational choice changes that it was possible for individuals to make. Four mutually exclusive types of change were of importance to Holland's theory. Any individual could have changed his or her vocational choice (a) to another vocation within the same major category, (b) to a vocation in an adjacent category, (c) to a vocation in a category that was neither adjacent to, nor across from, the original category, or (d) to a vocation in the category that was directly across from the original category. Theoretically, this configuration ordered the vocational changes on a continuum that ranged from geometrically small changes to geometrically large changes. A fifth category included individuals

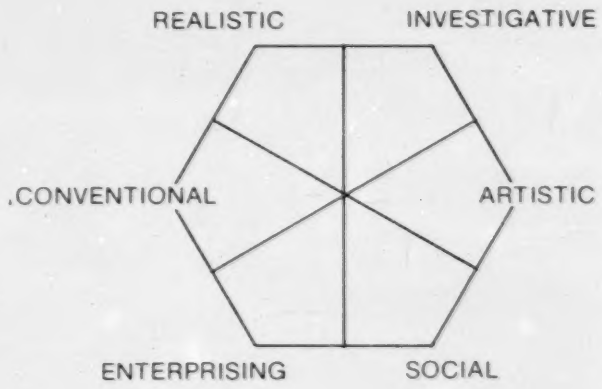

Fig. 1. Theoretical Space Occupied by Each of Holland's Six Occupational Types.

who, on both the pre- and postmeasures, gave identical first vocational choices. In this manner the five-category indicator of change (dependent variable) was constructed. A total of 4,592 individuals were classified according to the indicator by a computer program written specifically for this purpose. The indicator's five categories were labeled as follows:

1 = nonchangers
2 = within-class changers
3 = adjacent-class changers
4 = distant-class changers
5 = across-hexagonal changers.

The sample. The sample for this study consisted of students who were enrolled in 62 2-year community-junior colleges and vocational-technical institutions. Each of these institutions had been participants in the fall 1970 CPP norming. To be included in the sample, subjects must have met four criteria. First, they must have participated in the fall 1970 norming of the CPP. Second, they must have returned a completed SCPP on or before May 5, 1972. Third, *both* their fall 1970 expressed vocational choice and their spring 1972 expressed vocational choice must have been classifiable in terms of Holland's hexagonal model. Application of these criteria reduced the sample size from 4,592 to 4,406. Of those remaining, 55.7% were males and 44.3% were females. Finally, since a study of vocational choice changes requires that all individuals in the sample be specifically and correctly classified, individuals who were undecided on, or did not respond to, either the pre- or postmeasures of vocational choice were unclassifiable in terms of the dependent variable. Therefore, individuals of this "undecided—no response" type had to be excluded from the final sample. Application of the four previous sample selection criteria resulted in a final sample size of 2,928.

Collectively, the 62 participating institutions represented 33 states. Table 1 describes the composition of the final follow-up sample by regions of the United States. The southeastern and western regions were slightly overrepresented. It is important to note, however, that Florida and California are two of the leading states in the nation in the development of community-junior colleges; each is included in one of these regions. The high percentages reported for these two regions, therefore, are somewhat indicative of the actual distributions of these types of institutions and of students *in vocational*-technical programs in general.

Analysis. The data were first analyzed by comparing the proportions of each of the four types of change in each of the six major occupational categories. The purpose of these comparisons was to delineate patterns in the vocational choices of groups of individuals whose original vocational choices were in different major categories. Finally, a number of multiple discriminant function analyses were conducted. These analyses used the dependent variable (the vocational choice change indicator) as the criterion of group membership. The purpose of these discriminant analyses was to determine which, if any, of the 23 independent variables were useful, in a multivariate sense, for identifying those individuals who would later make some change in their vocational choices.

TABLE 1

Composition of Final Follow-up Sample by Region of the United States

Region	Number of institutions	Percent of total	Number of students	Percent of total
Eastern	10	16.1	381	13.0
Midwestern	7	11.3	429	14.7
Mountain-plains	7	11.3	294	10.0
Southeastern	17	27.4	848	29.0
Southwestern	4	6.5	355	12.1
Western	17	27.4	621	21.2
Total	62	100.0	2,928	100.0

Results

A total of 55.1% of the sample studied changed their vocational choice during the 18-month period encompassed by this study. Change rates varied considerably among categories. Individuals in the Conventional or Social categories, both of which were dominated by females, exhibited the least amount of change—i.e., 43.7% and 39.3%, respectively. Change rates for individuals in the Realistic Investigative, Artistic, or Enterprising categories were 48.4%, 51.5%, 57.7%, and 68.8%, respectively. Each of these four categories contained mostly males, with the exception of the Artistic category which had nearly equal proportions of males and females.

Table 2 presents the proportion of each type of change for males, for females, and for the combined final sample. Proportions relating to the vocational choice changes of males decreased in a monotonic fashion from within- to across-hexagonal changes, while similar proportions for females exhibited a reversal of adjacent- and distant-class changes. There was also a reversal of adjacent- and distant-class changes when proportions were calculated using both sexes combined.

Table 3 presents proportions of each of the four types of vocational choice change for groups of individuals whose original (1970) vocational choice placed them in one of the six Holland occupation

TABLE 2

Vocational Choice Changes Based on Holland's Hexagonal Model and the Scott, 1973 Sample

	Proportion of total		
Type of change	*Males*	*Females*	*Overall (males and females)*
Within-class changers	43.5%	44.2%	43.8%
Adjacent-class changers	28.4	15.7	23.3
Distant-class changers	19.8	32.4	24.8
Across-hexagonal changers	8.3	7.7	8.1
N	903	595	1,498

TABLE 3

Vocational Choice Changes Based on Holland's Hexagonal Model by Fall, 1970, Occupational Type for the Scott, 1973 Sample

	Holland category					
Type of change	*Real.*	*Inv.*	*Art.*	*Soc.*	*Ent.*	*Conv.*
Within-class changers	58.5%	32.5%	43.3%	59.6%	22.0%	24.6%
Adjacent-class changers	24.5	34.8	20.6	13.9	12.9	19.6
Distant-class changers	13.2	22.6	33.0	22.9	41.7	43.5
Across-hexagonal changers	3.8	10.1	3.1	3.6	23.4	12.3
N	425	385	97	280	132	179

types. The female dominated categories—i.e., the Social and Conventional types—both exhibited reversals of adjacent- and distant-class changes. The Social category included mostly within-class changers. Changers originally in the Conventional category tended to shift to occupations in either the Investigative or the Social categories; i.e., 43.5% made distant-class changes. Changers originally in the Artistic category tended to shift to other Artistic occupations. Changers whose 1970 vocational choice was in the Enterprising category accounted for more across-hexagonal changes than did any other of the groups of individuals; 24.5% of the individuals in this category shifted to an Investigative choice. When they changed, those in the Realistic category tended to select other Realistic occupations. Changers who had originally chosen Investigative occupations accounted for more adjacent-class changes than did any other group. The recipient of most of these changes was the Realistic category.

Because sex differences in vocation-related behavior have often been cited as being large, and because vocational opportunities are known to differ for males and for females, a presentation of vocational choice changes by sex is shown in Table 4.

The statistical significance of the difference between the proportions of male changers and of female changers in any of the four types of change was determined by a standard test of the difference between two independent proportions (Ferguson, 1971). A z-test was conducted for every cell percentage difference between males and females. Since the four tests in any of the columns were not independent, the .05 level of significance was conservatively estimated by using as a critical z the value of ±2.50 rather than the more commonly used, and less conservative, z value of ±1.96. These new z scores were computed by dividing the .05 α by four, and then, using as the new critical z the value which corresponded to the adjusted α level. Therefore, the apparent α was .0125, but the original α of .05 actually remained "relatively" unchanged. Differences which produce significant z values are designated by an asterisk (*) following the pairs of proportions.

There were a large number of substantial differences between male and female changers

TABLE 4

Vocational Choice Changes by Sex and Based upon Subject's Fall 1970 Occupational Type

Type of change		Holland category					
		Real.	*Inv.*	*Art.*	*Soc.*	*Ent.*	*Conv.*
Within-class changers	males	59.9*	33.3	40.3	22.7*	23.1	3.7*
	females	21.4	30.0	47.5	62.7	17.9	28.3
Adjacent-class changers	males	24.5	43.6*	14.0	18.2	5.8*	51.9*
	females	21.4	10.7	30.0	13.6	39.3	13.8
Distant-class changers	males	12.7	12.1*	43.9*	31.8	48.1*	40.7*
	females	28.6	51.5	17.5	22.1	17.9	44.1
Across-hexagonal changers	males	2.9*	11.0	1.8	27.3*	23.0	3.7
	females	28.6	7.8	5.0	1.6	24.9	13.8
Male N		411	282	57	22	104	27
Female N		14	103	40	258	28	152

*Difference between proportions is significant at the .05 level.

whose 1970 vocational choices had been in the same major category.

Stepwise multiple discriminant analysis was used to determine if changers and nonchangers differed significantly on any of the 23 independent variables. The utility of the independent variables to discriminate between changers and nonchangers was measured by the accuracy of classification on a cross-validation sample. If the changers and nonchangers differed on the 23 independent variables in a large and significant manner, then a high rate of accurate classification (percentage of "hits") would be obtained on the cross-validation analyses. With two groups (changers versus nonchangers) a chance level of classification would assign 50% of the sample to one group and 50% to the other. The percentage hit rate based on the discriminant analysis should be evaluated in terms of its improvement over a 50-50 split.

The highest cross-validation hit rate was obtained for male changers using interest measures (79.1% correct classifications). The lowest cross-validation hit rate was obtained for male nonchangers using ability measures (22.4% correct classifications). When both sexes were combined, four variables (sex, clerical competencies, art competencies, and trade interests) produced F-ratios which were significant at the .05 level. When only males were included in the analyses three variables (clerical competencies, clerical skills, and business contact interest) produced F-ratios which were significant at the .05 level. When only females were included in the analyses four variables (clerical competencies, art competencies, science competencies, and mechanical skills) produced F-ratios which were significant at the .05 level.

In a multivariate sense, the 23 independent variables examined in the present investigation were not particularly useful for discriminating between nonchangers and changers. On both the validation and cross-validation analyses males were more likely to be classified into the changer category than were females. This was simply because males were more likely to change their choice, at some point during the 18-month period studied, than were females. Of the 1,614 males in the final sample 903 or 55.9% changed their vocational choice. Of the 1,314 females in the final sample 595 or 45.3% changed their vocational choice.

For females, the nonacademic competencies contributed more to group differentiation than did either the ability or the interest measures. For males, the pattern was much more diffuse. In general terms, the clerical competencies variable was the most useful of the variables; this variable was consistently entered either first or second in each of the male and each of the female discriminant analyses. For the males, it should be noted that father's level of education was of some discriminating value.

In general, male changers tended to (a) report more business detail competencies, and (b) score slightly higher on trade interests than male nonchangers. Female changers tended to (a) report fewer science competencies, and (b) score slightly higher on business contact interests than female nonchangers. Aside from these few minor differences, nonchangers did not differ greatly from changers in terms of the independent variables examined in the present study.

Discussion

The transition from school to work is one that should be relatively easy for an individual to make. However, unless the individual has access to relevant career information, the transition period may be not only difficult, but may also result in a final placement that is, from both the individual's and the employer's perspective, less than optimal. The individual must have some realistic conceptions about important variables which are likely to influence both the long- and short-term consequences of his or her decisions. The problem which faces career development theorists and practitioners is that of defining avenues through which all types of individuals may easily become informed about the world of work.

Because the sample used in this study was more representative of the general adult population than has heretofore been the case in similar studies, and because the period of time encompassed by the pre- and postmeasures of vocational choice was at least half again as long as any used to date for this type of study, the empirical findings reported herein represent a qualitative improvement over those previously available.

Two major findings which emerged from this investigation may be of use in answering some of the previously-mentioned theoretical and practical concerns. The first finding is related to vocational choice patterns. Wide variations were noted in the types of vocational choice change. Of the 1,498

individuals who changed major categories, 30.0% changed to the Realistic category, 22.5% changed to the Investigative category, and 19.7% changed to the Social category. The other three occupational groups each received less than 10% of the changers. The guidance implications of these variations are important. Information about the type and frequency of choice changes made in the past by other students could be useful to students who are contemplating shifting their vocational choice. Such information could prove beneficial in their decision-making processes. In a more theoretical sense, the variations could be examined to gain insight into the reasons why certain types of choices seem to be more attractive than others. The second finding relates to the fact that changers differed very little from nonchangers in terms of the 23 interest, ability, and family background variables examined. This suggests that when individuals changed their vocational choices they did so not so much because they differed from those who typically kept the same vocational choices, but because of some other factor(s). Perhaps change resulted when an individual developed some form of cognitive dissonance from a personally unsatisfactory original vocational choice. Perhaps the individual's perception of employment possibilities changed significantly. Although this finding does not necessarily imply that these variables are not of any general use in identifying types of individuals who are likely to change their vocational choice, it does imply that these variables are not of much use in differentiating between changers and nonchangers when used individually. Perhaps composite indices based on these same variables would be more useful. This is certainly a topic that requires further exploration.

The reader will readily observe that our findings are not supportive of a nonrandom theory of vocational choice such as Holland's. This is particularly true for the findings pertaining to vocational choice patterns of females. The fact that there were substantial differences between the behavior of males and females has both theoretical and practical significance for theories of career development on the one hand, and for counseling and guidance practices on the other. Career development theorists and practitioners should re-examine their assumptions in light of these sex differences. To what extent are differences the result of forces imposed upon women, and men, by the existing culture? To what extent are they the result of differences between the sexes in interests and/or abilities? These data simply highlight the questions. Answers given now could only be speculative. In any case, serious consideration should be given to developing separate models of vocational choice which could more accurately reflect the behavior of both sexes. Increasing what is known about existing behavior differences will eventually result in an increase in our ability to correct any sex-based inequities in the present world of work.

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